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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,086	06/24/2003	Herbert William Doty	GP-302756	1903

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EXAMINER

MORILLO, JANEL COMBS

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/603,086	Applicant(s) DOTY, HERBERT WILLIAM	
	Examiner Janelle Combs-Morillo	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-14 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 4, 15 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 3, 6-14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 57-079140A (JP'140) optionally in view of "ASM Handbook: Vol. 15 Casting" pp 751-752.

JP'140 teaches an Al-Si-Cu alloy piston for an internal combustion engine with excellent heat resistance and impact strength (abstract) wherein said alloy consists of (in weight%): 8.5-13.5% Si, 2-4% Cu, 0.4-1.0% Mg, 0.4-0.8% Mn, 0.2-1.0% Fe, 0.1-0.35% Sb, which overlaps or touches the boundary of the presently claimed alloying ranges (instant claims 2, 3, 9-14, 16-18). Additionally, the Mn (0.4-0.8%) and Fe (0.2-1.0%) ranges and corresponding ratios implied by said ranges (Mn/Fe 0.4-4.0) overlap the instant Mn/Fe ratios.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

JP'140 does not mention forming said alloy into a cast engine block. However, JP'140 does mention that pistons for engines can be cast out of said alloy, wherein said pistons exhibit excellent heat resistance and impact strength (abstracts). It would have been obvious to one of

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ordinary skill in the art to cast the Al-Si-Cu alloy taught by JP' 140 into an engine block, because JP' 140 teaches that said alloy exhibits excellent heat resistance and impact strength (abstracts).

JP' 140 does not mention the addition of Sr. However, Sb and Sr are known equivalents, both of which are known modifiers of the Si eutectic (see "ASM Casting" p 751-752), and wherein 0.015-0.050% Sr is an effective as said modifier. It would have been obvious to one of ordinary skill in the art to replace Sb with Sr in the Al-Si-Cu alloy taught by JP' 140, because "ASM Casting" teaches that Sb and Sr are known equivalents.

Concerning claims 16 and 17, which mention the cast alloy is substantially free of primary silicon, the examiner points out that the presence of primary silicon depends on the alloy composition (i.e. see phase diagram of Al-Si, wherein the eutectic is at ~12.6% Si). Because JP' 140 teaches an alloy composition that substantially overlaps the presently claimed ranges, then substantially the same absence of primary silicon (and therefore presence of eutectic Al-Si) is expected to occur.

3. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 58-042748A (JP' 748).

JP' 748 teaches an aluminum alloy comprising: 5-10% Si, 0.2-1.0% Mg, 0.3-0.6% Fe, and 0.1-0.6% Mn, balance aluminum (see abstract), which substantially overlaps the presently claimed alloying ranges.

Additionally, the Mn (0.1-0.6%) and Fe (0.3-0.6%) ranges and corresponding ratios implied by said ranges (Mn/Fe 0.18-2) overlap the instant Mn/Fe ratios.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the

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range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

JP'748 does not mention forming said alloy into a cast engine block. However, JP'748 does mention that articles can be die cast out of said alloy, wherein said alloy composition exhibits good toughness and corrosion resistance (abstracts). It would have been obvious to one of ordinary skill in the art to cast the Al-Si-Cu alloy taught by JP'748 into an engine block, because JP'748 teaches that said alloy exhibits good toughness and corrosion resistance and is suitable for die casting (abstracts).

Allowable Subject Matter

4. Claims 4, 15, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art does not teach or suggest an Al-Si-Cu-Mn-Fe-Mg alloy consisting essentially of the presently claimed alloying ranges, complete with the instant Mn/Fe ratio. More particularly, the closest prior art, JP'140, does not teach or suggest the instant Al-Si-Cu-Mn-Fe-Mg alloy and the instant Mn/Fe ratio, complete with the presently claimed range of Mg of 0.15-0.3%.

Response to Amendment

5. In the response filed on October 4, 2004, applicant amended claims 10, 13, and 17, and submitted various arguments traversing the rejections of record.

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Applicant's argument that the present invention is allowable over the prior art of record because the proportion of Mn to Fe is demonstrates to be important (arguments p 7) has not been found persuasive. Applicant has not shown specific unexpected result demonstrating the criticality of the presently claimed Mn/Fe ratio.

Applicant's argument that the present invention is allowable over the prior art of record because the Al-Si alloy taught by JP'748 would not be suitable for an engine block has not been found persuasive. As stated above, it would have been obvious to one of ordinary skill in the art to cast the Al-Si-Cu alloy taught by JP'748 into an engine block, because JP'748 teaches that said alloy exhibits good toughness and corrosion resistance and is suitable for die casting (abstracts).

Applicant's argument that the present invention is allowable over the prior art of record because Sb and Sr are not universal equivalents known to modify the silicon eutectic has not been found persuasive. In the attached "ASM Handbook: Vol. 15 Casting" p 744 and 746 teaches that Sb and Sr are used as Al-Si eutectic modifiers. "ASM Casting" additionally teaches motivation to completely replace Sb with Sr- Sb is not compatible with other modifiers, and is also toxic. Therefore, because it is known that Sb and Sr are equivalent modifiers then it would have been obvious to replace Sb with Sr, as stated in the rejection above.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM 
December 22, 2004

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700